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Brain and Sensory Foundations Curriculum

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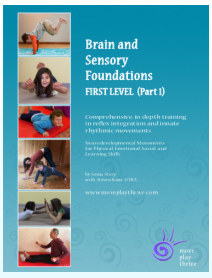

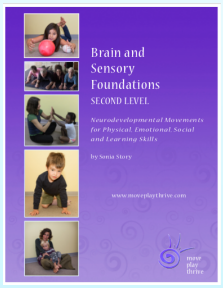

Sonia Story Background

- Working with infant reflexes since 2006 and with innate rhythmic movements since 2007
- Developer of the Brain and Sensory Foundations curriculum—comprehensive training in innate infant & integrative movements
- Private Practice: Neurodevelopmental Movement, all ages, infant to elder, with a main focus on school-age children.
- Wrote white paper with supporting evidence, relevance, and rationale for use in therapeutic settings.
- Presenter, Autism One conference, 2018
- Currently enrolled in Master's Program in Movement Science
- Teaching neurodevelopmental movement tools since 2006

Sensory-Motor Input *Required* for Normal Brain Development

Innate infant movements are essential to brain, body and sensory maturity

Neuropsychol Rev (2010) 20:327–348
DOI 10.1007/s11065-010-9148-4
REVIEW

The Basics of Brain Development

Joan Stiles & Terry L. Jernigan

Received: 7 August 2010 / Accepted: 11 October 2010 / Published online: 3 November 2010

essential role in establishing the mature organization of the neocortex. The development of normal brain organization requires input via all of the major sensory systems. When specific aspects of input are lacking, alternative patterns of brain organization can and do emerge. These alternative patterns of organization reflect the effects of altered profiles of neural competition and capture a fundamental property of mammalian brain development, the capacity for plastic adaptation.

The Role of Input on Brain Development

Greenough introduced the term "experience expectant" development to capture the idea that the early experience of the organism plays an essential role in normal brain development, particularly in the early postnatal period (Greenough et al. 1987). Although cortical patterning begins in the embryonic period it remains malleable for an extended period of time. Typical, expected, postnatal experience is necessary for the emergence of normal patterns of neocortical organization. When that input is lacking brain areas develop differently, and the specific

Primitive Reflex Activity in Relation to the Sensory Profile in Healthy Preschool Children

Received: 7 September 2020; Accepted: 2 November 2020; Published: 6 November 2020

Abstract: The presence of active primitive reflexes (APRs) in healthy preschool children can be an expression of immaturity in the functioning of the nervous system. Their trace presence may not significantly affect the quality of child functioning. They may also undergo spontaneous and complete integration within the stages of child development. However, a higher level of active reflexes and their significant number can disturb sensory-motor development and lead to additional problems in a child's motor activities, social life, and education. The main purpose of this study was to examine the types of sensory disorders noticed by parents of children, if any, that accompany the presence of active primitive reflexes. The study was conducted in a group of 44 preschool children (aged 4–6 years). The sensory profile of children was determined using Child Sensory Profile Cards, and Sally Goddard-Blythe tests were used to measure their primitive reflexes. The coefficient of determination (R-squared) indicated that the level of reflex activity was most strongly associated with sensory disorders such as dyspraxia, sensory-vestibular disorders, and postural disorders, at a level of $p < 0.005$. The obtained research results show that the examination of non-integrated reflexes might be a screening tool for children of preschool age. Knowledge of the subject of reflexes and their impact on sensory-motor functions may contribute to more accurate diagnoses of the causes of problems and higher effectiveness of possible therapy.

"Reflex activity was most strongly associated with sensory disorders such as dyspraxia, sensory-vestibular disorders, and postural disorders."

Pecuch, A., Gieysztor, E., Telenga, M., Wolańska, E., Kowal, M., & Paprocka-Borowicz, M. (2020). Primitive reflex activity in relation to the sensory profile in healthy preschool children. *International Journal of Environmental Research and Public Health*, *17*(21)

Research

Retained Primitive Reflexes Associated with ADHD

> Int J Neurosci. 2013 Nov;123(11):766-9. doi: 10.3109/00207454.2013.801471. Epub 2013 Jun 5.

Asymmetric tonic neck reflex and symptoms of attention deficit and hyperactivity disorder in children

Jana Konicarova [1], Petr Bob

Affiliations + expand

PMID: 23659315 DOI: 10.3109/00207454.2013.801471

"Results of this study show that ADHD symptoms are closely linked to persisting ATNR, which indicates that ADHD symptoms may present a compensation of unfinished developmental stages related to diminishing ATNR."

Research

Retained Primitive Reflexes Associated with ADHD

- Bob, P., Konicarova, J., & Raboch, J. (2021). Disinhibition of primitive reflexes in attention deficit and hyperactivity disorder: Insight into specific mechanisms in girls and boys. *Frontiers in Psychiatry*, *12*.
- Konicarova, J., Bob, P., & Raboch, J. (2013). Persisting primitive reflexes in medication-naïve girls with attention-deficit and hyperactivity disorder. *Neuropsychiatric Disease and Treatment*, *9*, 1457–1461.

Research

Retained Primitive Reflexes Associated with ADHD symptoms

- Primitive Reflexes and Attention-Deficit Hyperactivity Disorder: Developmental Origins of Classroom Dysfunction—Myra Taylor, Stephen Houghton, Elaine Chapman, *International Journal of Special Education*, vol. 19, no. 1, 2004
- Study tested Moro, ATNR, TLR and STNR
- "Results indicated that boys diagnosed with ADHD had significantly higher levels of reflex retention than non-diagnosed boys."

Retained Primitive Reflexes Associated with Opposition/Defiance and Inattention

Hickey, J., & Feldhacker, D. R. (2022). Primitive reflex retention and attention among preschool children. *Journal of Occupational Therapy, Schools, & Early Intervention, 15*(1), 1-13.

JOURNAL OF OCCUPATIONAL THERAPY, SCHOOLS, & EARLY INTERVENTION
2022, VOL. 15, NO. 1, 1–13
https://doi.org/10.1080/19411243.2021.1910606

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ARTICLE

Primitive reflex retention and attention among preschool children

Jennifer Hickey and Diana R. Feldhacker

Department of Occupational Therapy, Creighton University, Omaha, Nebraska, United States

ABSTRACT

Primitive reflexes are a critical part of early development but eventually integrate to give rise to volitional and cortically directed movements and higher-level cognitive skills. Failure to integrate these reflexes in a developmentally appropriate stage has shown correlation with developmental delays which affect occupational participation. Retention of reflexes may be linked to academic difficulties, including attention deficits in the classroom. The purpose of this study was to explore prevalence of primitive reflex activity among 4- to 6-year-old children and to understand the relationship between primitive reflex activity and attention. A total of 27 preschool students were screened

ARTICLE HISTORY
Received 15 July 2020
Accepted 25 March 2021

KEYWORDS
Primitive reflex; attention; reflex retention; development

Retained Primitive Reflexes Associated with Handwriting Challenges

Relationship of Retained Primitive Reflexes and Handwriting Difficulty in Elementary-Age Children

Lorie Richards, PhD, OTR/L, FAOTA[1], Ryan Avery, MOT, OTR/L[2], Sarah Gray[1], Robin Price, OD[3]

[1]University of Utah, Salt Lake City, UT, USA; [2]Alpine School District, American Fork, Utah, United States; [3]Child & Family Eye Care Center, Pleasant Grove, Utah, United States

DOI: 10.5014/ajot.2022.76S1-RP10

Date presented: April 3, 2022

Primary Author and Speaker: Lorie Richards, lorie.richards@hsc.utah.edu

PURPOSE: Primary school children are often referred to Occupational Therapy for handwriting difficulties. Handwriting training programs improve handwriting, but many continue to struggle with handwriting legibility and speed (Case-Smith, 2002). As handwriting is the primary method used to demonstrate abilities and knowledge in specific academic content areas (Case-Smith, 2002), poor or slow handwriting can be detrimental to school-based performance and result in academic failure, poor self-esteem, and limit participation in school-based activities (Case-Smith et al., 2011). Retained primitive reflexes may be one factor affecting handwriting that is not typically addressed. The typical integration of primitive reflexes allow the development of coordinated voluntary movement and mature postural reflexes. Primitive reflex retention has been found to be significantly associated with various problems, including gross motor deficits, lack of fine motor coordination, visual-perceptual deficits, behavior problems, and poor reading performance (McPhillips & Jordan-Black, 2007). If such reflex retention is found to be related to poor handwriting, adding reflex integration intervention to handwriting training may be more effective for these children than handwriting training alone. The purpose of this study is to determine if poor handwriting in early primary school children is related to primitive reflex retention.

Retained Primitive Reflexes Associated with Learning Challenges

JOURNAL OF OCCUPATIONAL THERAPY, SCHOOLS, & EARLY INTERVENTION
https://doi.org/10.1080/19411243.2021.1959482

Taylor & Francis
Taylor & Francis Group

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The Correlation between Retained Primitive Reflexes and Scholastic Performance among Early Elementary Students

Diana R. Feldhacker, Reilly Cosgrove, Ben Feiten, Kayleigh Schmidt, and Marissa Stewart

Department of Occupational Therapy, Creighton University, Omaha, Nebraska, USA

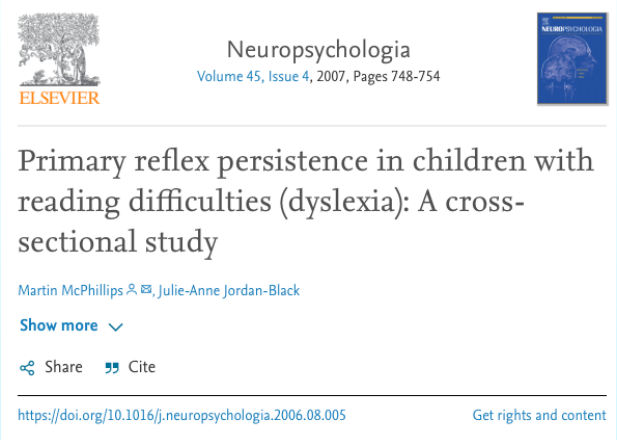
Feldhacker et al. (2021) found that for typically developing children between 5 and 7 years of age, the presence RPR were significantly associated with poorer scholastic performance in both boys and girls.

Retained Primitive Reflexes Associated with Learning Challenges

In a causal-comparative study 126 middle-school children between the ages of 10 and 13 years were assessed for two RPR measured using inter-rater reliability. The results showed that 50% of the children in a Minnesota public school setting had RPR (Oliver, 2020). When comparing the children with and without RPR, academic scores were lower in both math and reading for the children with RPR. There were statistically significant differences in math achievement between students with and without persistent asymmetrical tonic neck reflex (ATNR) and symmetrical tonic neck reflex (STNR).

Oliver, J. L. (2020). *Primitive Reflex Persistence in U.S. Middle School Students and Academic Reading and Mathematics* [Doctoral dissertation]. Grand Canyon University, Phoenix.

Retained Primitive Reflexes Associated with Learning Challenges



ELSEVIER

Neuropsychologia

Volume 45, Issue 4, 2007, Pages 748-754

Primary reflex persistence in children with reading difficulties (dyslexia): A cross-sectional study

Martin McPhillips, Julie-Anne Jordan-Black

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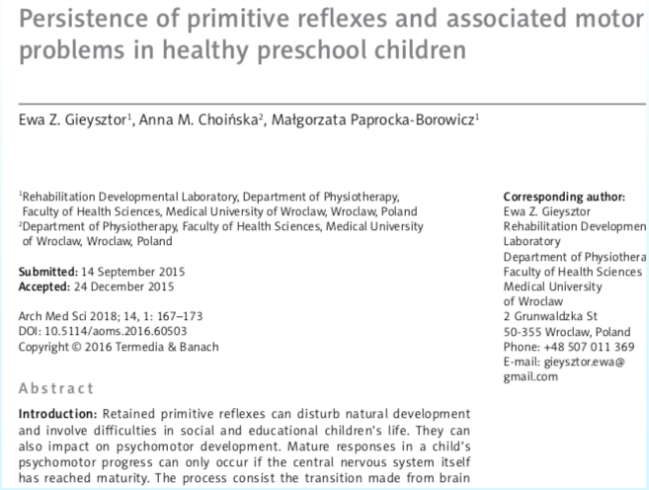
https://doi.org/10.1016/j.neuropsychologia.2006.08.005 Get rights and content

The level of retained ATNR was significantly greater in children from socially disadvantaged backgrounds. “Multiple regression analyses, involving all of the sample children, revealed that persistence of the ATNR was significantly predictive of attainments in reading” (McPhillips & Jordan-Black, 2007, p. 748).

Retained Primitive Reflexes Associated with Motor Problems

Gieysztor et al. (2018) found, RPR were common, even in healthy preschool children without a special needs designation. They also reported that even mild levels of RPR could have negative impacts on a child's psychomotor abilities (Gieysztor et al., 2018).



Persistence of primitive reflexes and associated motor problems in healthy preschool children

Ewa Z. Gieysztor[1], Anna M. Choińska[2], Małgorzata Paprocka-Borowicz[1]

[1]Rehabilitation Developmental Laboratory, Department of Physiotherapy, Faculty of Health Sciences, Medical University of Wroclaw, Wroclaw, Poland
[2]Department of Physiotherapy, Faculty of Health Sciences, Medical University of Wroclaw, Wroclaw, Poland

Submitted: 14 September 2015
Accepted: 24 December 2015

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DOI: 10.5114/aoms.2016.60503

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gmail.com

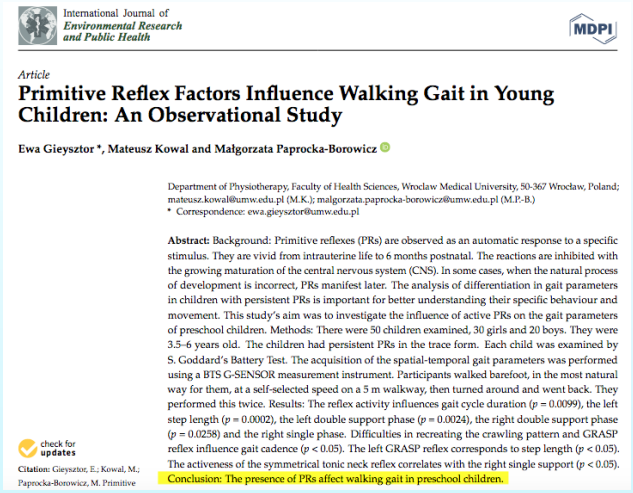
Abstract

Introduction: Retained primitive reflexes can disturb natural development and involve difficulties in social and educational children's life. They can also impact on psychomotor development. Mature responses in a child's psychomotor progress can only occur if the central nervous system itself has reached maturity. The process consist the transition made from brain

Retained Primitive Reflexes Associated with Motor Problems

Gieysztor et al. (2020) found that the presence of a retained ATNR in boys and girls with an average age of 5 years resulted in pelvic asymmetries and irregular walking gait.

Gieysztor, E., Pecuch, A., Kowal, M., Borowicz, W., & Paprocka-Borowicz, M. (2020). Pelvic symmetry is influenced by asymmetrical tonic neck reflex during young children's gait. *International Journal of Environmental Research and Public Health, 17*(13), 4759.



International Journal of *Environmental Research and Public Health*

MDPI

Article

Primitive Reflex Factors Influence Walking Gait in Young Children: An Observational Study

Ewa Gieysztor *, Mateusz Kowal and Małgorzata Paprocka-Borowicz

Department of Physiotherapy, Faculty of Health Sciences, Wroclaw Medical University, 50-367 Wroclaw, Poland; mateusz.kowal@umw.edu.pl (M.K.); malgorzata.paprocka-borowicz@umw.edu.pl (M.P.-B.)
* Correspondence: ewa.gieysztor@umw.edu.pl

Abstract: Background: Primitive reflexes (PRs) are observed as an automatic response to a specific stimulus. They are vivid from intrauterine life to 6 months postnatal. The reactions are inhibited with the growing maturation of the central nervous system (CNS). In some cases, when the natural process of development is incorrect, PRs manifest later. The analysis of differentiation in gait parameters in children with persistent PRs is important for better understanding their specific behaviour and movement. This study's aim was to investigate the influence of active PRs on the gait parameters of preschool children. Methods: There were 50 children examined, 30 girls and 20 boys. They were 3.5–6 years old. The children had persistent PRs in the trace form. Each child was examined by S. Goddard's Battery Test. The acquisition of the spatial-temporal gait parameters was performed using a BTS G-SENSOR measurement instrument. Participants walked barefoot, in the most natural way for them, at a self-selected speed on a 5 m walkway, then turned around and went back. They performed this twice. Results: The reflex activity influences gait cycle duration ($p = 0.0099$), the left step length ($p = 0.0002$), the left double support phase ($p = 0.0024$), the right double support phase ($p = 0.0258$) and the right single phase. Difficulties in recreating the crawling pattern and GRASP reflex influence gait cadence ($p < 0.05$). The left GRASP reflex corresponds to step length ($p < 0.05$). The activeness of the symmetrical tonic neck reflex correlates with the right single support ($p < 0.05$). Conclusion: The presence of PRs affect walking gait in preschool children.

check for updates

Citation: Gieysztor, E.; Kowal, M.; Paprocka-Borowicz, M. Primitive

Delayed Early Motor Milestones Associated with Autistic Behavior Severity


AUTISM RESEARCH INSAR

SHORT REPORT

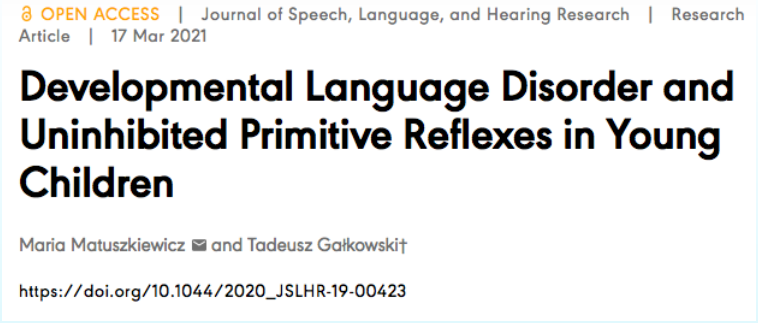
Relationship between early motor milestones and severity of restricted and repetitive behaviors in children and adolescents with autism spectrum disorder

Mirko Uljarević, Darren Hedley, Gail A. Alvares, Kandice J. Varcin, Andrew J. O. Whitehouse

First published: 16 March 2017 | https://doi.org/10.1002/aur.1763 | Citations: 16

Uljarević, M., Hedley, D., Alvares, G. A., Varcin, K. J., & Whitehouse, A. (2017). Relationship between early motor milestones and severity of restricted and repetitive behaviors in children and adolescents with autism spectrum disorder. *Autism Research, 10*(6), 1163–1168.

Retained Primitive Reflexes Associated with Developmental Language Disorder


OPEN ACCESS | Journal of Speech, Language, and Hearing Research | Research Article | 17 Mar 2021

Developmental Language Disorder and Uninhibited Primitive Reflexes in Young Children

Maria Matuszkiewicz and Tadeusz Gałkowski†

https://doi.org/10.1044/2020_JSLHR-19-00423

Children with DLD demonstrated higher levels of persistent primitive reflexes compared to TD children. All primitive reflexes (the Moro reflex, the symmetrical tonic neck reflex in flexion and in extension, the asymmetrical tonic neck reflex, the tonic labyrinthine reflex, and the Galant reflex) turned out to be statistically significantly different for the TD and DLD groups ($p < .001$). Matuszkiewicz, M., & Gałkowski, T. (2021). Developmental Language Disorder and Uninhibited Primitive Reflexes in Young Children. *Journal of Speech, Language, and Hearing Research, 64*(3), 935–948.

RESEARCH: Emotional and Behavioral Difficulties Linked to Motor Skills Deficits and Retained Primitive Reflexes

the british psychological society
promoting excellence in psychology

British Journal of Educational Psychology (2020), 90, 719–735
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www.wileyonlinelibrary.com

Motor problems in children with severe emotional and behavioural difficulties

Bronagh Taylor[1], Donncha Hanna[1] and Martin McPhillips[2]*
[1]Queen's University, Belfast, UK
[2]Edge Hill University, Lancashire, UK

For more information about innate movements, sign up for our free monthly newsletter at https://moveplaythrive.activehosted.com/f/17

Children with emotional and behavioral difficulties (EBD) also tend to have motor skills deficits and retained primitive reflexes compared to children with no EBD.

Motor issues and retained primitive reflexes were each statistically significant predictors of EBD.

"Specific approaches aimed at improving different aspects of motor function in school children with EBD should be incorporated into classroom practice as a matter of urgency, with a particular emphasis on early intervention"

Taylor, B., Hanna, D., & McPhillips, M. (2020). Motor problems in children with severe emotional and behavioural difficulties. *British Journal of Educational Psychology*, *90*(3), 719–735.

From IEP to all As and Bs on Report Card

Case study by Jennifer Davis, COTA/L

- Medically diagnosed ADHD
- Results in 6 months, Nov 2019 to April 2020
- 1- 15 minutes per day, 3 to 5 times per week
- Had been in Speech Therapy since age of 3, dismissed at age 12

Before	After
Fearful of going anywhere in public without her mom	Able to visit the restroom on her own
Struggled with balance, skipping, hopping, and toe walking	Much less clumsy and has stopped running into things around the house; also shows improved gait pattern and stronger heel strikes
Struggled with writing fluency	Can write multiple paragraphs that are on topic, flow well, and use much more mature language and correct verb tense usage
Struggled with math	Scored an 'A' on a math test for the first time; also, mental math has improved significantly
Struggled with focus	Studying on her own without prompting, using much more mature language and vocabulary, and has all A's and B's on her report card

Retained primitive reflexes: Perceptions of parents who have used Rhythmic Movement Training with their children

Tessa M Grigg, Wendy Fox-Turnbull, Ian Culpan

First Published March 12, 2018 | Research Article | Find in PubMed | Check for updates

https://doi.org/10.1177/1367493518760736

Article information

Rhythmic Movement Training (RMT) is a movement program combining innate infant rhythmic movements and reflex integration.

Grigg et al. (2018) study on in-home application of RMT with children by parents for at least six months. Parents reported that RMT was cost-effective, easy to apply in their daily lives, and that RMT helped their children make improvements in academic, social, and emotional realms.

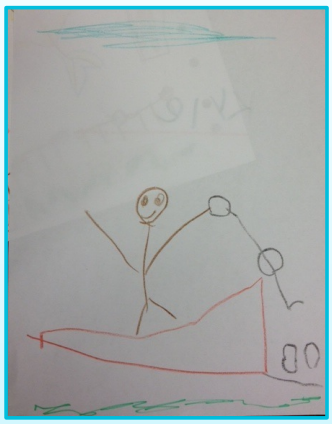
Grigg, T. M., Fox-Turnbull, W., & Culpan, I. (2018). Retained primitive reflexes: Perceptions of parents who have used Rhythmic Movement Training with their children. Journal of Child Health Care, 22(3), 406–418. https://doi.org/10.1177/1367493518760736

Gazca (2010) Master's Thesis Survey on RMT

- For five of the six ADHD-related items on the survey, between 82% and 92% of Gazca's respondents (n=79) agreed or strongly agreed that RMT was effective for helping with ADHD symptoms.
- 75% of respondents agreed or strongly agreed that RMT was effective for sensory sensitivities to touch and motion.
- 94.8% indicated that RMT was effective in reducing muscle tension. Muscle tension is a known element of primitive reflex activity (Gieysztor et al., 2020) and is associated with hyper-activity and impulsivity (Konicarova et al., 2013).
- Over 87% of respondents indicated that RMT was effective for reducing anxiety (87.5%) and hyperactivity (87.5%), both of which are commonly found in ADHD (Gair et al., 2021; Schatz & Rostain, 2006)*. Gazca, M. (2012). *Rebooting development with a rhythmic motor intervention for children* [Unpublished master's thesis]. St. Catherine University, Minneapolis
- *See additional references last slide.

Rhythmic Movement Calms, Organizes & Matures, Brain and Sensory Systems

Before and After 10 minutes of innate rhythmic movement—from Kyle, 5 years old.
Submitted by his mother, a physical therapist



Before and After Innate Rhythmic Movements

After 15 minutes of innate rhythmic movement—First Session
5 year old girl, presenting with motor planning / coordination concerns.

"This is a little girl who not long before this cried in my movement class, looking down at her legs, 'they don't work!' "

Lisa Muir, BSc hons OT

Before and After Innate Rhythmic Movements

6 year old boy, with inattentive behaviors, poor posture and ocular motor concerns.
After, 15 minutes of R.M. Also his first session.

"Truly that was his posture after!"

Lisa Muir, BSc hons OT

Rationale for Why Innate Infant Movements Work

- Innate rhythmic and reflex movements drive brain, body, and sensory development

- *Myelination increases greatly in the first three years of life during normal development*
  Carmody, D. P., Dunn, S. M., Boddie-Willis, A. S., DeMarco, J. K., Lewis, M., 2004.

- *Learning a new motor skill also increases myelin.**

- *Rate of learning [a new motor skill] correlates significantly with increased myelin density** *Sampaio-Baptista, C., Khrapitchev, A.A., Foxley, S., Schlagheck, T., Scholz, J., Jbabdi, S., DeLuca, G.C., Miller, K.L., Taylor, A., Thomas, N., Kleim, J., Sibson, N.R., Bannerman, D., Johansen-Berg, H., 2013

Primitive reflex movements improve reading fluency, balance, oculomotilities, and reduces headaches

Wahlberg T, Ireland D.
Can Replicating Primary Reflex Movements Improve Reading Ability?
Optom Vis Dev 2005;36(2):89-91

Abstract

Background: Poorly integrated and inhibited primitive reflexes can impact an individual's visual development, balance system and academic performance, most notably in the area of reading. Children diagnosed with reading learning disabilities were assessed in the areas of oculomotilities, tonic reflexes, balance and fine motor. They were also given a headache questionnaire. Students participated in a movement program designed to decrease the amount of primitive reflex present, improve the balance and visual systems and reading ability.

Method: The study evaluated 22 students, ages 7 to 11, who were previously diagnosed with reading learning disabilities. All students were given a treatment program of repetition of primary reflex movements during one academic year.

Results: Students showed a marked decrease in the presence of primitive reflexes, improved balance and oculomotilities, a decrease in headaches and improved reading fluency.

Reflex Integration Improves Reading and Writing

McPhillips, M., Hepper, P., & Mulhern, G. (2000)
Effects of replicating primary-reflex movements on specific reading difficulties in children.

Lancet: 355 (9203), 537–41, 2000.

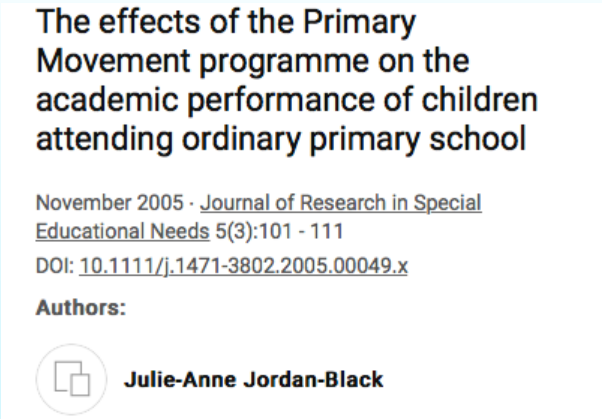
THE LANCET

- Randomized
- Double Blind
- Placebo Controlled

Experimental group that received ATNR movements made significant gains in reading skills and writing speed over the control group.

doi:10.1016/s0140-6736(99)02179-0

Reflex integration improves reading and mathematics



The effects of the Primary Movement programme on the academic performance of children attending ordinary primary school

November 2005 · Journal of Research in Special Educational Needs 5(3):101 - 111

DOI: 10.1111/j.1471-3802.2005.00049.x

Authors:

Julie-Anne Jordan-Black

"It was found that the movement intervention programme had a very significant impact on reducing the levels of ATNR persistence . . . Associated with very significant improvements in reading and mathematics, in particular."

Integrating primitive reflexes is associated with improvement in motor skills, perceptual abilities, and emotional regulation

brain sciences

MDPI

Article

Primitive Reflex Activity in Relation to Motor Skills in Healthy Preschool Children

Anna Pecuch [1], Ewa Gieysztor [1,*], Ewelina Wolańska [2], Marlena Telenga [1] and Małgorzata Paprocka-Borowicz [1]

"Properly selected exercises and therapeutic activities aimed at integrating [retained primitive reflexes] in children with developmental difficulties can improve their motor skills, perceptual abilities, and emotional behavior."

Pecuch, A., Gieysztor, E., Wolańska, E., Telenga, M., & Paprocka-Borowicz, M. (2021). Primitive reflex activity in relation to motor skills in healthy preschool children. *Brain Sciences, 11*(8), 967.

Innate reflex movements are effective to increase motor and cognitive function in children with ADHD.

Melillo Robert, Leisman Gerry, Mualem Raed, Ornai Alon, Carmeli Eli (2020), *Persistent Childhood Primitive Reflex Reduction Effects on Cognitive, Sensorimotor, and Academic Performance in ADHD*
Frontiers in Public Health, VOLUME 8 2020, PAGES 684
DOI=10.3389/fpubh.2020.431835

Persistent Childhood Primitive Reflex Reduction Effects on Cognitive, Sensorimotor, and Academic Performance in ADHD

Robert Melillo [1], Gerry Leisman [1,2], Raed Mualem [3], Alon Ornai [3] and Eli Carmeli [1]*

[1] Department of Physiotherapy, Faculty of Social Welfare and Health Sciences, University of Haifa, Haifa, Israel, [2] Neurofisiología Clínica, Instituto de Neurología y Neurocirugía Neurofisiología Clínica, Universidad de Ciencias Médicas, Havana, Cuba, [3] Oranim Academic College, Qiriat Tivon, Israel

A study was performed on 2,175 individuals between the ages of 3.2 and 22.04 years diagnosed with Attention Deficit Hyperactivity Disorder (ADHD) and drawn from 89 separate locations across the United States in satellite clinics with common practices and common staff training and equipment. The objective was to determine the efficacy of a hemispheric-based training program to reduce extant retained primitive reflexes (RPRs) and examine the relationship to motor function by metronome-based motor, DL, and cognitive tasks measured by subtests of the Wechsler Wide Range Achievement Test. After a 12-week program, RPR's were significantly reduced, as well as performance on all motor and cognitive measures significantly increased. Listening comprehension demonstrated significant increases between pre- and post-testing of 7% ($W = 1213000$;

Are innate reflex movements are effective?

"The Integration exercise programme is particularly effective in the case of children exhibiting a whole set of symptoms along with learning difficulties, problems with concentration, weak emotion control, weak motor development, abnormal muscle tension, weak motor coordination."

Grzywniak, Celestyna. (2017). Integration exercise programme for children with learning difficulties who have preserved vestigial primitive reflexes. Acta Neuropsychologica. 15. 10.5604/01.3001.0010.5491.

RESEARCH ARTICLE

ACTA Vol. 15, No. 3, 2017, 241-256 NEUROPSYCHOLOGICA

Received: 11.12.2016
Accepted: 28.09.2017

A – Study Design
B – Data Collection
C – Statistical Analysis
D – Data Interpretation
E – Manuscript Preparation
F – Literature Search
G – Funds Collection

INTEGRATION EXERCISE PROGRAMME FOR CHILDREN WITH LEARNING DIFFICULTIES WHO HAVE PRESERVED VESTIGIAL PRIMITIVE REFLEXES

Celestyna Grzywniak
Pedagogical University of Krakow, Krakow, Poland

SUMMARY

Background: The main goal of the research was to determine the usefulness of the *Integration exercise programme* stimulating development in children with learning difficulties who have preserved vestigial primitive reflexes. Their symptoms included weak motor and visual-motor coordination, lowered visual and auditory analysis and synthesis which resulted in difficulties in reading and writing, disrupted emotional development, psychomotor hyperactivity, weak concentration and other symptoms.

Material/ Methods: 104 children with learning difficulties and other accompanying symptoms took part in the experiment. The children were trained

Infant Rhythmic Movements
Establish Brain Connectivity and Sensory Maturity

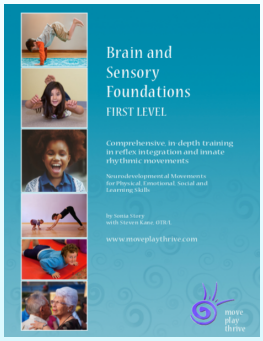
- Brain Stem to Limbic and Cortex— connections for:
  - Attention, focus, executive functions—foresight, good decisions, communication
  - Impulse control, emotional development
  - Ability to filter and modulate sensory information
  - Muscle tone
- Cerebellum to Cortex—connections for:
  - Attention, focus, executive functions—foresight, planning, solving problems
  - Mature eye movements, ability to track
  - Speech development
  - Learning/memory, speed of information processing
  - Reading comprehension

Brain and Sensory Maturity
Depends on innate rhythmic and reflex movements to mature Brainstem, Cerebellum, and Basal Ganglia

- Basal Ganglia
  - Must be mature for ability to be still
  - Stillness is not possible without a mature and well functioning basal ganglia
  - Example: child with hyperactivity, ADHD (“Feels like I’m gonna explode”)
  - Example: Parkinson’s disease involves damage to basal ganglia cells

- You cannot mature the brain, body and sensory systems without the full repertoire of innate infant rhythmic and reflex movements

Brain and Sensory Foundations, First Level
Tuition 495 USD



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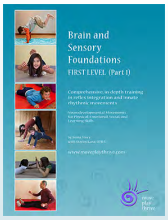
- Innate rhythmic movements
- Targeted plus playful integration for: 11 infant reflexes—TLR, ATNR, STNR, Hands, Feet, Moro, Fear Paralysis Reflex, Spinal Galant, Headrighing
- Support via phone, email, & live, online Q & As
- Tools to release anxiety boost goal attainment
- TONS of student resources, freebies, and FB collaboration
- 100 page spiral bound, course reference manual

Brain and Sensory Foundations Curriculum

Brain and Sensory Foundations First Level

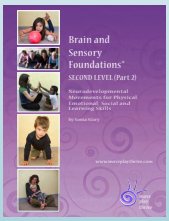
More about the First Level here.



- Brain Tune up
- Innate Rhythmic Movements
- Tonic Labyrinthine Reflex
- Asymmetrical Tonic Neck Reflex
- Symmetrical Tonic Neck Reflex
- Hand Reflexes: Grasp and Palmar/Babkin
- Foot Reflexes: Plantar and Babinski
- Fear Paralysis Reflex
- Moro Reflex
- Spinal Galant Reflex
- Headrighting Reflexes
- 5-Step Balance Process for Reflex Integration and Attaining Goals

Brain and Sensory Foundations Second Level

More about the Second Level here.



- Innate Rhythmic Movements
- Spinal Perez Reflex
- Landau Reflex
- Amphibian Reflex
- Crossed Extensor Reflex
- Parachute Reflex
- Pull-to-Sit Reflex
- Foot Tendon Guard Response
- Facial Oral-Motor Reflexes
- Birth and Bonding Processes
- Extra tools for Asymmetrical Tonic Neck, Babinski, and Fear Paralysis Reflexes
- Infant Torticollis Protocol

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*Additional References from Slide 20

Gair, S. L., Brown, H. R., Kang, S., Grabell, A. S., & Harvey, E. A. (2021). Early development of comorbidity between symptoms of ADHD and anxiety. *Research on Child and Adolescent Psychopathology, 49*(3), 311-323.

Schatz, D. B., & Rostain, A. L. (2006). ADHD with comorbid anxiety: a review of the current literature. *Journal of Attention Disorders, 10*(2), 141-149.